

CLAIMS:

1. A data storage system comprising a set of structures including :
 - a first structure of layers including at least a first ferromagnetic layer and a second ferromagnetic layer with at least a separation layer of a non-magnetic material therebetween, said first structure having at least a magneto resistance effect ;
 - 5 - a second structure including at least one magnetic layer, said second structure influencing at least one intrinsic magnetic characteristic of said first structure ;
 - and said second structure being separated from said first structure by at least a spacer layer, wherein the non-magnetic material is a metal and the spacer layer comprises a high-resistive metallic material and said spacer layer furthermore causing a mainly
 - 10 ferromagnetic coupling of said second structure on said first structure while not substantially influencing the magnitude of the magneto resistance effect of said first structure.
2. A system as recited in claim 1 wherein said second structure comprises at least one layer of a magnetic material of a high coercivity.
- 15 3. A system as recited in claim 1 wherein said second structure comprises at least one layer of an exchange biasing material.
4. A system as recited in claim 1 wherein said second structure comprises a layer
- 20 that has a magnetization direction that is substantially anti-parallel with respect to the magnetization direction of said first ferromagnetic layer.
5. A system as recited in claim 1 further comprising a third structure including at least one magnetic layer, said third structure influencing at least one magnetic characteristic
- 25 of said first structure, said second structure at least partly compensating for the influencing of said third structure on said first structure.

6. A system as recited in claim 1 wherein said layer of a high-resistive metallic material furthermore is at least partially inducing a crystallographic characteristic on said second and/or said first structure.

7. A system as recited in claim 6 wherein said layer of a high-resistive metallic material is one of the group of Ti, Zr, Hf, V, Nb, and Ta, or any combination thereof.

8. A system as recited in claim 6 wherein said layer of a high-resistive metallic material has a thickness in the range of one atomic layer up to 15 nm.

9. A system as recited in claim 6 wherein said layer of a high-resistive metallic material is one of the group of Mo, Cr, and W or any combination thereof.

10. A system as recited in claim 6 wherein said layer of a high-resistive metallic material is a metallic polymer with a conductivity in the range of the conductivities of the group of Ti, Zr, Hf, V, Nb, Ta, Mo, Cr, and W or any combination thereof.

11. A system as recited in claim 6 wherein said second structure is separated from said first structure by at least said layer of said high-resistive metallic material and an insulating layer abutting said layer of said high-resistive metallic material.

12. A system as recited in claim 1 wherein the set of structures is part of a magnetic memory structure such as a MRAM structure, preferably being integrated on a semiconductor substrate.

13. A sensing system of a magnetic characteristic, said system comprising :
- a first structure of layers including at least a first ferromagnetic layer and a second ferromagnetic layer with at least a separation layer of a non-magnetic material therebetween, said first structure having at least a magneto resistance effect ;
- a second structure including at least one magnetic layer, said second structure influencing at least one intrinsic magnetic characteristic of said first structure ; and said second structure being separated from said first structure by at least a spacer layer, wherein the non-magnetic material is a metal and the spacer layer comprises a high-resistive metallic material and said spacer layer furthermore causing a mainly ferromagnetic coupling of said

second structure on said first structure while not substantially influencing the magnitude of the magneto resistance effect of said first structure.

14. A method of fabricating a magnetic system, the method comprising the steps of :

- defining a first structure of layers including at least a first ferromagnetic layer and a second ferromagnetic layer with at least a separation layer of a non-magnetic metallic material therebetween, said first structure having at least a magneto resistance effect;
- defining a second structure, said second structure including at least one magnetic layer or a set of layers for influencing at least one intrinsic magnetic characteristic of said first structure ; and

- defining at least one layer of a high-resistive metallic material in-between said second structure and said first structure, and said layer of a high-resistive metallic material furthermore at least partially inducing a crystallographic characteristic on said second structure.

15. A method of tuning a magneto resistance characteristic of a magnetic system, the system comprising a set of structures including a first structure of layers including at least a first ferromagnetic layer and a second ferromagnetic layer with at least a separation layer of a non-magnetic metallic material therebetween, said first structure having at least said magneto resistance characteristic, the method comprising the steps of :

- defining a layer of a high-resistive metallic material on said first structure ;

and

- defining a second structure including at least one magnetic layer on said layer of said high-resistive metallic material, said second structure said second structure including at least one magnetic layer or a set of layers for influencing at least one intrinsic magnetic characteristic of said first structure.

16. A magnetic system such as data storage system or a sensing system of a magnetic characteristic, the system comprising a set of structures including :

- a first structure of layers including at least a first ferromagnetic layer structure and a second ferromagnetic layer with at least a separation layer of a non-magnetic material therebetween, said first structure having at least a magneto resistance effect ;

- a second structure including at least one magnetic layer, said second structure influencing at least one intrinsic magnetic characteristic of said first structure ;

- said second structure being separated from said first structure by at least a spacer layer of a high-resistive metallic material and said spacer layer of a high-resistive metallic material furthermore influencing the coupling of said second structure on said first structure while not substantially influencing the magnitude of the magneto resistance effect of said first structure; and wherein

- said first ferromagnetic layer structure and said second structure respectively comprising an even or odd number of non-abutting ferromagnetic layers and an odd or even number of non-abutting ferromagnetic layers.